AYUSHDHARA
ISSN: 2393-9583 (P)/ 2393-9591 (O)
An International Journal of Research in AYUSH and Allied Systems

Review Article

NECESSITIES OF YOGIC PRACTICES AND AYURVEDIC NUTRACEUTICAL *(RASAYANA)* DURING PREGNANCY

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Article info
Article History:
Received: 16-03-2025
Accepted: 19-04-2025
Published: 20-05-2025
KEYWORDS:
Ayurveda, Health, Pregnancy, Prenatal yoga, Yoga.

ABSTRACT

Pregnancy is a beautiful and extraordinary phase of every female life either human or animal. Every day around 150 women die due to causes related to pregnancy and childbirth. Globally, it is estimated that 13% of maternal deaths occurred due to improperly performed procedures and unnecessary interventions. In pregnancy nutraceutical deficiency can lead to premature birth of child, neurological defects in the child and many more complications. In pregnancy many unusual clinical symptoms such as stress, anxiety, depression, mood swings, nausea, vomiting, easy fatigability, morning sickness, painful leg cramps, malaise in eyes, breathing problems, swollen ankle and feet, constipation, varicose vein, braxton hicks contraction and nutraceutical deficiency can lead to premature birth of child, neurological defects in the child and many more complications. Yoga & Ayurveda, are the ancient and holistic health science that have the power to keep the person healthy and manage many illnesses related to pregnancy and other general disorders. Daily practice of yoga and righteous use of *Rasayana* therapy enhances immunity, provide strength to body and helpful to deal with pregnancy related challenges, improve birth weight, decrease preterm labor, manage pain, reduced mental stress, anxiety and depression.

INTRODUCTION

Pregnancy is a beautiful and extraordinary phase of every female life either human or animal. It brings many physiological and psychological changes in their life, especially in second and third trimester.[1] From the day of conception till birth (40 weeks or 280 days), pregnant women or *Garbhini* may suffer from many unusual clinical symptoms such as stress, anxiety, depression, mood swings, nausea, vomiting, easy fatigability, morning sickness, painful leg cramps, malaise in eyes, breathing problems, swollen ankle and feet, constipation, varicose vein, braxton hicks contraction or false labor pain, insomnia, increased frequency of urination and lower back pain.[2,3] Evidences suggest that during third trimester women experience 70% back pain, 60% shortness of breathing, 60% haemorrhoids, 50% increased frequency of urination, 40% constipation, 20% swollen feet and 10% leg cramps.[1] The most common complaint is lower back pain in 20-90% pregnancies.[4] The reason of back pain is outcome of day-by-day baby growth and accumulation of fluids in the uterus that impart significant pressure over back region. It may lead to alter the spinal curvature and redistribution of ligaments.

A healthy *Garbhini* is directly linked to healthy progeny, so any infection can affect the child. Variety of stressors are the triggering factor for all the complaints to the pregnant. Maternal stress and anxiety can trigger the release of harmful peptides such as cortisol hormone (major stress hormone) and other substances that can cross the placental barrier and reach to the fetus. Later, these substances (harmful peptides) have capacity to influence the development and normal programming of central nervous system and peripheral nervous system of fetus. In early days of pregnancy (first trimester) stress can slow down the growth and development process of fetus, which manifest in many ways such as affecting

Access this article online
Quick Response Code
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the growth and maturation of different organ or system of fetus. It may also lead to behavioural and cognitive dysfunction later in life that can manifest in various forms such as decreased brain size and increased risk of neurodevelopmental condition such as attention deficit hyperactivity disorder, autism spectrum disorder and learning disabilities.[5]

Every day around 150 women die due to causes related to pregnancy and childbirth. Globally, it is estimated that 13% of maternal deaths occurred due to improperly performed procedures and unnecessary interventions.[6] Globally, 2.4 million infants are died in their first month of life. (WHO, 2020) Approximately 7000 new born die each day. Every year in India, 3,341,000 neonates are born prematurely, and 3,61,600 children under the age of five die from complication associated with premature birth.[7,8] Additionally there are several factors play a major role in child birth such as proper diet and nutrition, genetic factor, environmental factor, maternal well-being etc. Currently, approximately 15.1% of expectant mother practice Yoga on doctor recommendation, which is significantly lower than the general population of 45% in United States.[9,10] Still there is lack of attention towards antenatal check-ups and myths related to physical activity and proper nutrition of a pregnant woman in India. Many recent research suggests that if parents have illness like diabetes, obesity, hypertension, asthma etc. that can be easily transmitted in child before birth. That condition is termed as gestational conditioning.

Yoga & Ayurveda, are the ancient and holistic health science that have the power to keep the person healthy and manage many illnesses related to pregnancy and other general disorders. These two are found to be effective, safe, and acceptable for a pregnant woman and these are needed to be implemented in her day-to-day life. Yoga balances the body, mind and soul, whereas *Sadvritta* and *Rasayana* chikitsa of Ayurveda can rejuvenate mother body and give a sense of fulfilment of all nutrient. Yoga is originated from the root of the Sanskrit word "*Yuj*", which means "to unite" or "to join", which integrates physical, mental, emotional, and spiritual components via the practice of *Yama, Niyama, Asana, Pranayama*, mantra chanting, *Yoga nidra*, meditation etc. Ayurvedic nutraceutical play a major role in helping the body immune system of mother and child and development for the embryo. In pregnancy nutraceutical deficiency can lead to premature birth of child, neurological defects in the child and many more complications. Placenta play a very essential role for the transportation of nutrient from mother to fetus. Its vascular growth and capacity are influenced by the nutrients and oxygen transferred from the expectant mother to the fetus. Ayurveda recommended a unique dietary modification and lifestyle changes during pregnancy, that known as *Garbhini Paricharya* (antenatal care).[11] This combines approach of Ayurveda and Yoga can make the journey of pregnant women and progeny easier and peaceful. The classical references have also been founded in *Charaka Samhita Sharira Sthana* in term of pregnant lady can do *Chankramana*, which is refer to brisk walk in today's time.

Prenatal Yoga

Prenatal yoga is a bunch of yogic practice that perform during pregnancy with modification that meet the requirement and necessities of individual pregnant women. These practices consume very less energy and give numerous benefits by increasing blood circulation in the body and genital parts. Yoga is thought to improve all the physiological functions and psychological well-being by working on all the respective systems and give a sense of calmness and balance the emotion during pregnancy. All these practices are always performed under the supervision of well-educated and trained antenatal yoga therapist because a little mistake in pregnancy can create complication. Research shows that prenatal yoga improve quality of sleep, strengthen the body, increase flexibility and endurance of muscle, reduced lower back pain, nausea, tones the muscle of uterus which help to support the added weight of uterus and prepare mother body for hassle free childbirth.[3] Regular practice of yoga release happy hormone like endorphins, serotonin and dopamine that keep mother energetic and positive throughout the day and erect all the mood swings, negative emotion and thought.[12]

Yoga practices during Pregnancy

Yoga practices such as *Yama, Niyama, Asana, Pranayama*, meditation, *Mantra* chanting and *Yoga nidra* play a major role to pregnant women for their overall wellbeing. With the help of all these practices women feel more connected with their child. During all these practices every individual woman should listen their body and must have to pay attention prior to health history and start slowly.

***Yama- Niyama* (Ethical Commitment)**

Yama and *Niyama* are moral code of conduct along with lifestyle changes that should follow to every mother as well as every person in their daily life. *Yama* is the five commandments, which are "non-violence *(Ahimsa),* truth *(Satya),* non-stealing *(Asteya),* celibacy *(Brahmacharya),* and non-possessiveness *(Aprigraha)."* *Niyama* is the five-self-purification technique, which are purity of body and mind *(Shauch),* contentment *(Santosh),* self-discipline *(Tapa),* study of literature *(Swadhyaya),* and surrender to God *(Ishwar-*

pranidhan)".[13] These 5 codes of conducts and 5 observation make women more confident with the pregnancy and fetus. Regular practice of *Yama- Niyama* enhances the power of self-control, make her more aware with respect to their diet and dietary habits, cleanliness, honesty and discipline to act in daily life. Cleanliness of urogenital part is utmost important because urinary tract infection is common during pregnancy. Worship of God, chanting of *Mantras* and reading the good scripture to be implemented during pregnancy that create harmony and serenity in women's mind as well as in fetus. *Yama-niyama* helps women to connect with their physical bodily change and prepare her mentally and emotionally fit for normal labor.

Asana

Asana is the heart of *Ashtanga yoga*. It provides strength to pelvic floor muscle, increase the flexibility of spine, tone up the lower body part and increases blood circulation in urogenital region, thus improve the nourishment to that region during pregnancy. *Asana* develops steadiness in body and excrete toxins from the body due to vasodilatation. In pregnancy asana increase stamina, enhance sleep pattern, relieves breast discomfort, tone up the muscle of abdomen and pelvis region, improve digestion, relieve from constipation and physical and mental stress. It also helps to impart functioning of normal fetal movement and ejection of fetus.[3,13] During the pregnancy inversion asana is completely restricted because inversion alter blood flow (toe to head) that create negative pressure on uterus which may affect the growth of the fetus. The whole pregnancy time period is divided into three trimester and asana according to each trimester are as follows

First Trimester (0-3 month)

First trimester is very crucial because in this stage women have higher chances of miscarriage. In this stage standing *Asanas*, lateral bending movement and joint loosening exercise should be practised because these help to strengthen the muscles of legs, arms and pelvic areas and increase blood circulation in body. This trimester required extra attention and care. In first trimester some *Asana* which can be performed are given in table 1 and backward bend, forward bend and forceful abdominal contraction is completely restricted.[14,15]

Table 1: First Trimester (0-3 month)

Asana	**Benefits**
Ardhtitliasana or *Purna-titliasana*	It releases tension of inner thigh muscle and loosen the tightness of hip muscle that will aid in delivery.
Pawanmuktasana Series I	It releases the tension of all joint and can be performed during whole pregnancy.
Tadasana	• It develops physical and mental balance and enhance attention. • It stretches the rectus abdominus muscle and the intestine that toned abdominal muscle and nerve and further remove constipation. • It stretches spine and relax the tension of spinal cord.
Triyaka Tadasana	• It tones arms, legs, and abdominal organ. • It alleviates constipation which is a major complication during pregnancy. • It stretches and release the tension of spine.
Vajrasana	• It is only one asana, that can be performed after eating food. • It Increases blood flow in pelvic region and strengthen the muscle of pelvic floor. • It helps in relieve constipation and acidity. • It increases digestive fire and facilitate proper digestion.
Vrikasana	• It strengthens the leg muscles, knee joints and abdominal region. • It reduces the hyperactivity of urine. • It gives a sense of physical and mental balance.
Sukhasana	• It facilitates physical, mental, and emotional balance.

Second trimester (4-6 month)

Asanas that put strain on the abdominal region should be strictly avoided during the second and third trimesters because they create negative pressure on the foetus. The *Asana* which are helpful are given in table 2. [3,13,15]

Table 2: Second trimester (4-6 month)

Asana	**Benefits**
Matsyakridasana	• It stimulates digestive fire and help in relieving constipation. • It relaxes the muscle of spine and legs and gives relief in back pain.
Marjariasana	• It tones reproductive system organ and muscle of the pelvic region. • It also increases helps to relax the tension of muscle of spine and legs.
Rajju karshan	• It stretches and release the tension of shoulder's muscle • It relieves from the discomfort of breast.
Suptudrakarshanasana	• It stretches the muscle of spine, neck and legs. • It improves bowel movement and relieve constipation; • Increase digestive fire

Asanas, which facilitate relaxation of pelvic bones especially pubic bones are found effective in this stage for normal delivery. Besides, such type of *Asanas* also provide strength to muscles' and improve blood circulation in that particular area. In this concern following *Asanas* (table 3) are helpful.[3,14,15]

Table 3: Third Trimester (7-9 month)

Asana	**Benefits**
Veerbhadrasana	• It stretches the groin area and keep the legs strong which further strong *Apana Vayu* because *Apana Vayu* is responsible to hold child in womb and expel the child at its birth.
Bhadrasana	• It releases the tension of pelvic region and helps in facilitating normal delivery and also reduce fatigue.
Greeva sanchalan	• It helps to prepare breast tissue for lactation and decrease breast discomfort.
Chakki chalasana	• It is perfect asana for third trimester especially in 8th & 9th of pregnancy because it tones the nerve and muscle of pelvic region and prepare body for normal delivery.
Vipritkarni asana	• It should be performed in modified form. • It helps in relieving backache and give relaxation in complication of swelling legs and varicose vein which is very common symptoms of pregnancy.

Pranayama

Pranayama is the gateway to purify body, mind and intellect. It improves circulatory system, remove toxins from the body, calm the nervous system. Deep breathing is useful during pregnancy because, in mid of second trimester with the growth of fetus the uterus is enlarged to such an extent that pushes the diaphragm upwards, that may cause shortness of breathing. In this time pranayama helps to mother to stay calm, relaxed and maintain the growth and development of fetus.[3] Stress induced hypertension and diabetes is common in pregnancy in this stage. Both jointly are important causative factor of pre-eclampsia. Therefore, these two must be control under normo-stasis, which is important for health of mother and fetus. Pre-eclampsia effect 5-8% of pregnancy and it is major cause of maternal and perinatal mortality and morbidity. Sanjeev et.al did 8 weeks study, they found that regular practice of *Bhramari pranayama* reduced cardiovascular hype-activity to cold stress, reduced basal blood pressure, rise blood pressure and reduced heart rate.[16] During pregnancy balancing and tranquilizing *Pranayama* like *Ujjayi, Bhramari, Nadishodhan, Sheetli, Sitkari* is recommended because they balance the body and mind and calm the body.[13]

***Mantra* chanting**

Mantra chanting is ancient practice that describe well in Yoga & Ayurveda. Om is the most common and spiritually recited mantra which almost recited in every household. The vibration of om chanting produce sensation in auricular branch of vagus nerve, that active parasympathetic nervous system and give calming effect on body and mind.[17] According to research of Quantum Science, "Om is the one powerful sound that has the power to vibrate whole universe". In Ayurveda *Garbhsanskara* is very important part of pregnancy in which one is mantra chanting. Shanti et.al found that regular Om chanting empowers women internally, enhance immunity, reduced anxiety and depression.[18]

Yoga Nidra & Meditation

Yoga nidra is the state between wakefulness and sleep that induces deep relaxation. *Shavasana* is the best practice to relax body and mind. It eliminates physical and mental tension and work at the level of subtle aspect of consciousness. Kumar et.al did a 21day *Yoga nidra* session study on anxiety in pregnant women and they found significant reduction in anxiety level.[19] This also increase concentration power, improve sleep quality, calm body and prepare mind for further practice like meditation.[3] Meditation is a state of where mind becomes concentrated and focused. Mindfulness meditation practice enhanced activation of prefrontal cortex that further increase antibody concentration. It can also improve neurobiological indexes, increase sensitivity of sensory stimuli, boost immunity, decrease the level of cortisol hormone, improve behavioural regulation and increase subjective well-being.[20,21]

Restricted yoga practices during pregnancy

- *Uddiyan bandha* is completely restricted during pregnancy and in breast feeding condition because it create intra-abdominal pressure on abdominal wall which cause strain to growing fetus.[3,13]
- Inversion posture like *Shirshasana, Sarvangasana* etc and backward *Asana* like *Chakrasana*, *Bhujangasana* etc rigorous practices are also restricted.[3,13]
- *Suryabhedan* and *Bhastrika pranayama* is restricted because these comes under vitalizing *Pranayama*. This *Pranayama* increase heat in the body that can harm foetus and mother health.[3,13]
- *Shatkarmas* like *Vaman, Kunjal, Nauli, Agnisar kriya, Kapalbhati* etc is completely restricted.[3,13]

Ayurvedic Nutraceutical during Pregnancy

A nutritious diet plays an important role during pregnancy for the development and equilibrium of the microbiota, metabolism, physiological changes, and immune system for fetus and mother. Low nutritional intake in early stage of pregnancy may risk for adverse side effects during pregnancy as well as on birth outcome. Embryo is combination of sperm, ovum and life principle implanted in womb.[22] Ayurveda work on three fundamental pillars: *Dosha, Dhatu* and *Mal*. Balance in these prevent from disease and maintain health. In Ayurveda, ancient *Acharya* described proper code of conduct or program for *Garbhini* (pregnant women) is called *Garbhini paricharya.*

Rasayana chikitsa is the eight limbs of *Ashtanga Ayurveda. Rasayana* therapy emphasis on herbal remedies, dietary modification, lifestyle changes and detoxification technique. It plays important role in every aspect of life from fertilization, to gamete development, fetal growth, birth, youth, adulthood till old age. [23] According to *Acharya* every nutraceutical or *Rasayan*, which are given to pregnant women should be soft, easy to digest and mild in action, so that the foetus can be protected from harmful effect of any drug.[24] Fetus is connected to mother through the placenta. Embryo can only develop when adequate nutrition is available. *Rasayana* clear *Strotas* and improve the quality of *Dhatus*, improve circulation of the body, reduces stress and anxiety, provide strength to the body and keep the body disease free. *Rasayana chikitsa* can only give on the prescription of well-educated Ayurvedic obstetrician.

Some specific Nutraceutical for Pregnancy

According to Acharya Charak and Sushrut, cow milk and ghee are the two best ingredient that should be taken during pregnancy. In fifth months, foetus mind becomes active and it will gain the power of perceiving thing, so in these months or upcoming month of pregnancy proper amount of cow milk and ghee is boon for growth, development and making the mind of foetus. Cow ghee contains high quality saturated fatty acid, which balances *Vatta* and *Pitta* in the body. Further, it promotes digestion and nourishes the pregnant women body and foetus. Ayurveda also suggested that having date with cow milk during pregnancy help in the condition of anaemia and good for generate bones and blood of fetus but milk with banana is completely restricted because it can hamper health of mother as well as child too.[25]

- ***Shatavari*** (*Asparagus racemosus* willd)– *Shatavari* pacify *Vata pitta*, improve intellectual power and cerebral circulation, offers neurotronic and galactagogue property, nourish womb, strengthen mother and foetus body, beneficial in the condition of oligospermia.[26] Stress generates reactive of oxygen species that causes oxidative stress that may lead to deteriorate oocytes quality. *Shatavari* promotes antioxidant property which has the power to overcome from stress related reproductive health complications.[27]
- ***Makhana*** (*Euryale ferox* salish)– It protects mother womb from miscarriage condition, nourishes and strengthen mother body, beneficial in postnatal weakness, and boost stamina.[26]
- ***Haritaki*** (*Terminalia chebula* retz) – It contains 18 amino acid, anti-inflammatory property and pacify *Vata pitta kapha dosha* especially *Vata dosha.* It is very useful in white discharge and spermatorrhoea, weakness during pregnancy, strengthen musculoskeletal system and increases the power of senses.[26]
- ***Amalaki*** (*Emblica officinalis* gaerth)– It provides nourishment during pregnancy, prevent from

anaemia, helpful in white discharge, spermatorrhoea, pacify *Tridosha* and reduces stress.[26]

- ***Guduchi*** (*Tinospora cordifolia*)– It provides good impact in pregnancy related symptoms like nausea, vomiting, pain, acidity, frequent urination etc.[26]
- ***Ashwagandha*** (*Withania somnifra*)– It reduces stress, depression and calm body, purify blood, give relief in pain and increase sleep quality, strengthen body and have good aphrodisiac property.[26]

DISCUSSION

Yogic practices and Ayurvedic nutraceuticals are now gradually popularising over the globe. These measures are being not only accepted not only Maternal hemodynamic is closely associated with profound adaptive changes during pregnancy in which autonomic nervous system plays an important role in the adaptation.[6] In pregnancy emotional regulation affected because of the hormonal changes which leads to depression, moodiness, irritability and appetite problems. Tugba et.al fount that yoga intervention group had higher rates of vaginal delivery, reduces labour intervention rates and episiotomy opening as well it decreased the levels of stress and anxiety.[28] Yoga can activate competing impulses in the central nervous system, boosting the release of natural endorphins and serotonin, which helps to reduce pain perception. It also improves spinal flexibility and enhances the circulation of cerebrospinal fluid (CSF) around the brain and spinal cord. This increased CSF flow raises the levels of endorphins and serotonin, by virtue of this act, it elevates the mind-body threshold for pain.[29] A study has explained the mechanism of how breathing in *Pranayama* stage interacts with the nervous system affecting metabolism and autonomic function. They suggest slow breathing in *Pranayama* mechanically stretches the neural and non-neural tissue by generating inhibitory signals in cooperation with hyperpolarization current. Possibly these changes initiate the synchronization of neural elements in the nervous system and the adjacent tissues which ultimately causes a shift in autonomic balance towards parasympathetic dominance.[30] Sunita et.al observed significant improvement in maternal and neonatal outcome after the practice of yoga and meditation.[31] *Yama* and *Niyama* are the pre-practice of yoga that prepare body and mind for further practices like *Asana*, *Pranayama* etc. *Asana* stretches and release bodily tension, increase blood flow and provide strength to body whereas *Pranayama* after *Asana* induces calming effect and increases the oxygen consumption in the body. After these *Yoga nidra* and meditation practices keep body and mind calm, connected and concentrated with self and fetus. *Rasayana* nourish fetus and mother, reduce anxiety and strength the body. Ghee based *Rasayana* nourish the nervous system and strengthen muscles of the body

CONCLUSION

Pregnancy is a beautiful yet crucial phase in women's life because this journey is filled with so much inner and outer transformation and growth. It is the time women's body nurture and develop a new life inside their womb. This time women require proper nutrition, physical strength, emotional support and some extra care from family and society. Physical discomfort, mental and emotional disturbances are commonly observed features in day-to-day life of pregnant female, which interfere to the wellbeing of mother and fetus. pregnancy may lead to create stress in some of the pregnant women that give pressure on sympathetic division of autonomic nervous system that may lead to miscarriage, premature delivery, labour related problems and interfere wellbeing of fetus. Therefore, daily practice of yoga and righteous use of *Rasayana* therapy enhances immunity, provide strength to body and helpful to deal with pregnancy related challenges, improve birth weight, decrease preterm labor, manage pain, reduced mental stress, anxiety and depression.

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Cite this article as:
Shivani Chauhan, Ajai Kumar Pandey. Necessities of Yogic Practices and Ayurvedic Nutraceutical (Rasayana) During Pregnancy. AYUSHDHARA, 2025;12(2):57-63.
https://doi.org/10.47070/ayushdhara.v12i2.1929
Source of support: Nil, Conflict of interest: None Declared

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